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CURRENT LITERATURE

BOOK REVIEWS

North American Uredineae

PROFESSOR J. C. ARTHUR has begun his presentation of the Uredineae in the *North American flora.*[1] No one who has kept informed of our mycological literature, even in the most general way, needs to be told that the author is the leading American specialist on this group of fungi, and that this is the first attempt to monograph the rusts for the whole continent. Heretofore one has had to depend on the restricted paper of BURRILL dealing with the rusts of Illinois, and FARLOW'S *Host index of North American fungi*, on the special papers by ARTHUR, HOLWAY, and others, and on the check lists and *exsiccati* that have been issued from time to time. The need of the work, therefore, cannot be questioned, and no one who has been engaged in a similar task can fail to appreciate the immense amount of effort it has required to bring it thus far toward completion. The part already issued, which includes descriptions of about 150 species and 34 genera, the writer understands to be but the advance guard of two or more parts to be issued later, as the material is worked up.

The monograph is thoroughly well done. It presents a uniform treatment of description and terminology. The bringing together and describing anew all stages, especially the pycnia which have largely been neglected before, make it especially valuable. It also reflects our latest knowledge of the life-history of the various species, to which the author has so long contributed with telling results. As to the real usefulness of the specific keys given under the genera, perhaps there may be some question, but the author no doubt has made them as valuable as they can be made. Mycologists have gone so far in describing new species of rusts (and other fungi as well) chiefly because they occur on new hosts, that one in self-defense acquires the habit of disregarding keys, so far as possible, and uses the host and specific description as the shortest route to identification. Then, too, it is very difficult to discover sufficient morphological characters for use in keys to distinguish the species of a large genus, so that frequently the host genera and families are necessary as characters to fill deficiencies. In his keys ARTHUR has made use of both hosts and morphological characters, using the latter apparently whenever possible.

Aside from the unquestioned merit of the work, the reviewer would dissent strongly from the point of view that compelled the author to split up old genera and to coin many new specific names. These changes did not all appear for the first time in the work under review, but they are all brought together here, and so focus our attention on the ninety (about) specific names (considerably over one-half) that bear ARTHUR's name as their authority; and he is also responsible for sixteen (about one-half) of the genera. However, he is not quite so extreme in this respect as MURRILL has been in his monograph of the Polyporaceae. ARTHUR has obtained part of his genera from new material and part by splitting up old genera, basing the new genera largely upon their possession of one or more of the O, I, II, III stages characteristic of the rusts. His familiarity with the rusts is such that he is able apparently, if given only the II stage, to tell what other stages it possesses, and so can place it in a genus.

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[1] ARTHUR, JOSEPH CHARLES, North American Flora.—Uredinales (Coleosporiaceae, Uredinaceae, Aecidiaceae pars) 7:83–160. 1907.

Judging from this past tendency to publish new species under the old recognized genera, a tendency he has not yet entirely lost, I expressed doubt to the late Professor UNDERWOOD, editor of the *Flora*, that ARTHUR would follow his Vienna paper in his treatment of the North American Uredinales. As he did follow it, however, I promptly received from UNDERWOOD the following: "Some time ago you charged that ARTHUR was not possessed of the courage of his convictions in regard to his publication of genera in the Uredinales. I commend to your prayerful attention the second part of Vol. VII of *North American flora*, issued March 6, and move that it is time to have a retraction of that charge." I herewith publicly make that retraction; but what will become of this nomenclature when some ambitious name-juggler revises our rusts fifty years hence, or possibly even after the next botanical congress!—G. P. CLINTON.

NOTES FOR STUDENTS

Turgor and osmotic pressure.—The relation between these stands in great need of accurate study. LEPESCHKIN, a few months ago, discussed the matter before the German Botanical Society.[2] After reviewing the terminology, he designates as turgor and turgescence the condition of tenseness of the tissues due to internal pressure in the cells. For quantitative purposes he defines as a turgor pressure (*Turgordruck*) the total pressure exercised by "cell contents" upon the "cell walls;" but he evidently means by *Zellinhalt* the cell sap, for he explains that the *Zellwände* must be of plasmatic nature. By turgor tension (*Turgordehnung*) he designates the elastic elongation of the walls in any dimension, wrought by turgor pressure. This only partly accords with the best usage in this country, where turgidity rather than turgescence names the condition, and turgor the internal pressure which produces turgidity, while turgor tension has seldom been considered quantitatively. LEPESCHKIN then analyses turgor pressure into four components: (*a*) surface tension (*Zentraldruck*), varying between 0.016 and 1.6 atmospheres, with a variation of 10–12 per cent.; (*b*) swelling of the plasma (*Quellungsdruck*); (*c*) the osmotic pressure of substances dissolved in the plasma; and (*d*) the osmotic pressure of the cell sap and the wall

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[2] LEPESCHKIN, W. W., Ueber den Turgordruck der vacuolisierten Zellen. Ber. Deutsch. Bot. Gesells. **26a:**198. 1908.